

WHAT IS CLAIMED IS:

1. A catheter assembly comprising:

an elongated catheter having an inner member and an outer member extending along a longitudinal axis, the inner member and the outer member having a coaxial configuration and dimensioned for relative axial movement, and wherein the outer member has a wall defining an opening; and

an expanding member connected to the inner member and being adapted to engage with the opening so as to maintain rotational alignment between inner member and outer member, the inner member including a distal portion adapted to receive a medical device and the outer member being adapted to at least partially cover the medical device and retractable to uncover the medical device.

2. The catheter assembly of claim 1 wherein the expanding member has opposing ends, further comprising a tubular sleeve defining a lumen, the ends of the expanding member being positioned within the sleeve lumen and the sleeve being positioned externally around and coaxially aligned with the inner member.

3. The catheter assembly of claim 1 wherein the expanding member is adapted to flexibly deform sufficiently to disengage from the opening and allow relative axial movement between inner member and outer member.

4. The catheter assembly of claim 1 wherein the expanding member is made of a nickel-titanium alloy.

5. The catheter assembly of claim 1 wherein the outer member has a wall, the thickness of the wall adjacent the edges of the opening being greater than the average thickness of the wall over the length of the outer member.

6. The catheter assembly of claim 1 further including a stent mounted on the inner member.

7. A catheter assembly comprising:
  - a. a catheter having
    - i. a proximal end and a distal end;
    - ii. a distal opening at the distal end;
    - iii. a proximal opening spaced a relatively short distance from the distal end and a relatively long distance from the proximal end;
    - iv. a passageway for a guide wire extending between the distal opening and the proximal opening;
    - v. an inner member and an outer member extending along a longitudinal axis, the inner member and the outer member having a coaxial configuration and dimensioned for relative axial movement, the inner member including a distal portion adapted to receive a medical device and the outer member being adapted to at least partially cover the medical device and retractable to uncover the medical device, wherein the outer member has a wall defining the proximal opening; and
    - vi. an expanding member connected to the inner member and being adapted to engage with the proximal opening so as to maintain rotational alignment between inner member and outer member.

8. The catheter assembly of claim 7 wherein the passageway is adapted to receive a guide wire inserted into the passageway, and to direct an end of the guide wire onto the expanding member.

9. The catheter assembly of claim 8 wherein the expanding member is adapted to deflect the end of the inserted guide wire through the proximal opening.

-15-

10. The catheter assembly of claim 7 wherein the outer member is adapted to deform the expanding member when the outer member is moved axially in relation to the inner member.

11. The catheter assembly of claim 7 wherein the expanding member is adapted in relation to the outer member to disengage from the proximal opening when the outer member is moved axially in relation to the inner member.

12. The catheter assembly of claim 7 wherein the expanding member has opposing ends, further comprising a tubular sleeve defining a lumen, the ends of the expanding member being positioned within the sleeve lumen and the sleeve being positioned externally around and coaxially aligned with the inner member.

13. The catheter assembly of claim 7 wherein the expanding member is adapted to flexibly deform sufficiently to disengage from the proximal port and allow relative axial movement between inner member and outer member.

14. The catheter assembly of claim 7 herein the expanding member is made of a nickel-titanium alloy.

15. The catheter assembly of claim 7 herein the expanding member is made of a chromium-cobalt-nickel alloy.

16. A catheter assembly comprising:  
an elongated catheter having an inner member and an outer member extending along a longitudinal axis, the inner member and the outer member having a coaxial configuration and dimensioned for relative axial movement, and wherein the outer member has a wall defining a longitudinal slot; and  
a leaf spring connected to the inner member and being adapted to engage with the longitudinal slot so as to maintain rotational alignment between

-16-

inner member and outer member, the inner member including a distal portion adapted to receive a medical device and the outer member being adapted to at least partially cover the medical device and retractable to uncover the medical device.

17. The catheter assembly of claim 16 wherein the leaf-spring has opposing ends, further comprising a tubular sleeve defining a lumen, the ends of the leaf-spring being positioned within the sleeve lumen and the sleeve being positioned externally around and coaxially aligned with the inner member.

18. The catheter assembly of claim 16 herein the leaf-spring is adapted to flexibly deform sufficiently to disengage from the slot and allow relative axial movement between inner member and outer member.

19. The catheter assembly of claim 16 herein the leaf-spring is made of a nickel-titanium alloy.

20. The catheter assembly of claim 16 herein the leaf-spring is made of a chromium-cobalt-nickel alloy.